Incorporating "The Illuminating Engineer."

Light and Lighting

Official Journal of the Illuminating Engineering Society.

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Principal Contents:

The I.E.S. Carries On

THE I.E.S. has come to the end of another Session, surely one of the strangest in the history of the Society.

During a period marked by the extinction of all ordinary outdoor lighting and an inevitably diminished demand for many forms of interior lighting, interest in the Society's activities has been maintained and belief in its future stronger than ever.

It is certainly evidence of remarkable vigour that in this second war-session income from subscriptions has actually increased. Even more heartening is the general desire of members to be of service and their determination to rise above adverse circumstances.

Recent papers before the Society have naturally been devoted largely to two topics, war-time industrial lighting and A.R.P. lighting problems.

Now a third topic—and a vast one—the part to be played by lighting in post-war reconstruction is put up for consideration. It may be true that the end of the present conflict is not in sight, but it is likewise true, as was well said by Mr. R. O. Ackerley, that the end, when it does come, may be sudden and unforeseen. It is therefore wisdom for the Illuminating Engineering Society to give some thought to these problems *now*, so that it may be prepared with plans when the emergency arises.

Accidents in the Streets

We have frequently drawn attention to the statistics issued periodically in regard to road accidents in this country, analysis of which should prove instructive in the future. After the outbreak of war there was a staggering increase in the number of fatalities, accentuated by the black-out during the winter months, when the proportion of accidents occurring by night reached the unprecedented value of 80 per cent. During 1940 matters at first improved somewhat. It was reported that in the first half of the war there was a reduction of about 40 per cent. in the total of reported accidents as compared with 1939. This result was only apparently reassuring however, as it was obtained by comparison with a pre-war period, when the volume of traffic was doubtless very much greater. During the dark winter months there were new high records, over the 1,000 mark, for fatalities and in December the highest ever attained for a single month, 1,313, was reached The early months of 1941 likewise showed increases. There were 726 deaths in April and 834 in March, as compared with 451 and 496 last year—rises of 67-70 per cent. The night accidents/day accidents ratio was, however, somewhat less (e.g., 1: 1.9 for April, 1941, as compared with 1 : 1.5 for April, 1940). Comparisons for May and subsequent months will naturally be upset by the introduction of double summer time.

I.E.S. Local Centres

The conference of representatives of I.E.S. Local Centres, held in London on May 13th, proved to be a very useful one, representatives from all active centres being present—certainly evidence of keenness in these difficult times. There are a number of outstanding problems in connection with the organisation of these local centres, which are growing in membership and influence. We understand that these matters are to be further discussed at another conference, to be held in Leeds on July 2nd. It is all to the good that these problems should be studied now so that the lines of future development may be clearly defined

It is also of interest to record that efforts towards establishing a Local Centre in the Western area have led to the organisation of a meeting at the Engineers' Institute, Cardiff, on June 19th. Those anxious to share in the formation of this new centre should get in touch with Mr. S. G. Turner (Mervyn House, Frederick-street, Cardiff), who is acting as honorary secretary.

We also understand that efforts are being made towards the formation of yet another I.E.S. Centre, in the South West of England.

Effects of Trees on Street Lighting

Lighting experts are familiar with the problems created by the foliage of trees lining boulevards in residential cities. Trees, however agreeable by day, are apt to disturb plans for artificial lighting by night. In some cases the obstruction may be so great as to make central suspension inevitable. An investigation of such effects was recently reported by Mr. K. L. Partridge to the Illuminating Engineering Society (U.S.A.). The "effectiveness" of street lighting installations—judged in terms of "pavement brightness," "obstacle brightness" and "veiling brightness" (or glare)—was carried out in a number of tree-lined thoroughfares, the difference between the influence of the trees in the leaved and unleaved conditions being noted. As might be expected the effect of the foliage in diminishing the brightness of pavement and obstacles is considerable, and although the glare is also diminished this apparently did not serve to counteract the other drawbacks. It was judged that the decrease in relative effective illumination due to shading varied from 23 to 40 per cent.

Mr. & Mrs. Beuttell: An I.E.S. Wedding

Mr. A. W. Beuttell Mrs. Beuttell
Mr. A. P. Moreton Mrs. Brown Mr. J. S. Dow

Members of the I.E.S. will learn with interest of the recent marriage of Miss J. A. Moreton, who has been on the staff of the Illuminating Engineering Society ever since its commencement, to Mr. A. W. Beuttell, a past president of the society, whose association with it is also of very long standing. The wedding took place at St. Mary's Church, Wimbledon, on May 24th. Previously the bride had been presented with a handsome dressing case, the joint gift of a number of leading I.E.S. members who desired in this way to mark their appreciation of her long and faithful service to the society, which, we are glad to be able to report, will continue to receive her help during the immediate future. All members of the society, amongst whom both Mr. and Mrs. Beuttell are so widely known, will join us in expressing wishes for all possible future happiness.

I.E.S. Annual Meeting

Informal Luncheon—Annual Report and Accounts—Elected Members of Council — New By-Laws — Lighting Problems and Reconstruction.

It was a source of general satisfaction that nothing occurred to interfere with the annual I.E.S. events on May 13, the Conference of Representatives of Local Centres in the morning, the informal luncheon following and the annual general meeting in the afternoon, notwithstanding the severe air raids on preceding nights. The local centres were well represented, at the morning conference and subsequently (about twelve delegates attended). There was an attendance of about eighty at the luncheon, and an audience of well over 100 in the afternoon.

Informal Luncheon.

The luncheon at St. Ermin's Hotel was of a very simple character and the speeches were brief. After the usual loyal toast "The Illuminating Engineering Society" was proposed by Mr. Howard Robertson, who emphasised the importance of the part to be played by lighting in reconstruction problems and the interest taken by architects in these problems. The President, in responding, reviewed experience during the past session and dwelt on certain outstanding features, such as the researches on A.R.P. lighting and the carrying through of the scheme of Fellowship, and the enthusiasm shown by the various Local Centres, several of which he had visited during his term of office. He also congratulated Sir Duncan Wilson, who was amongst those present, on the realisations this year of his aim of securing legislation on industrial lighting—as illustrated in the terms of the Factories (Standards of Lighting) Regulations.

At the annual general meeting, held later in the lecture theatre of the Institution of Mechanical Engineers, the report of the council and accounts for the past year were formally adopted, and the usual formal resolutions were passed. The expression of thanks to the officers and council, moved by Mr. G. Herbert and seconded by Mr. H. W. Harris, was, however, very far from being merely a matter of form, as there was an evident recognition on the part of those present that they had done well in achieving so much in present circumstances.

Annual Report and Accounts.

The report, which had previously been circulated to all members, is, indeed, a very encouraging one. Papers read at meetings in London, though inevitably of a somewhat specialised character, have maintained a high standard. In spite of war distractions upwards of twenty meetings have been held by local centres, which in general have carried through their programmes with considerable perseverance and determination. The income received from subscriptions attained a record amount—surely a remarkable result in such times as these. Receipts include a contribution of 50 guineas, awarded by the London County Council for researches on the lighting of cinema auditoriums, carried out at their request in 1936. During the past year another £250 was allotted to the purchase of National Defence Bonds, bringing the total to £500. As the Society also holds £1.500 in 3½ per cent. War Stock, it has now created quite a substantial reserve. In this respect its position has steadily improved during recent years.

It is also noteworthy that, in spite of the claims of war service (upwards of 80 members are known to be serving with the Forces), about 90 new applications for membership were received during the past session. In spite of losses inevitable in present circumstances, the aggregate membership of the Society is being well maintained.

New Members of Council.

The report also recorded the election of Mr. W. J. Jones as president for the coming session, and the re-election of the existing vice-presidents and hon. secretary and hon. treasurer. In the course of the proceedings it was announced that a postal ballot, undertaken in order to determine the members of council for the coming session, had resulted in the election of the following:—

Mr. T. Catten, Dr. W. M. Hampton, Mr. J. W. Howell, Mr. W. F. Pogson, Mr. J. S. Preston, Mr. E. B. Sawyer, Mr. P. Crawford Sugg, Mr. H. C. Weston, and Dr. W. D. Wright.

Fellowship.

The report refers to two special achievements during the past session, the carrying through of the new scheme of Fellowship and the final revision of the new By-laws.

At the date of the report 81 Fellows have been elected. The council makes a well-merited reference to the services of those members who have served on the Board of Fellows and who have carried out their difficult duties in a very careful and conscientious manner.

Revised By-Laws.

Copies of the Revised By-laws had been circulated to all members prior to the meeting, and they were now presented to the meeting by Colonel Kenelm Edgcumbe, who recalled that the substance of these rules had been approved at the special meeting on December 5, 1939. The changes since made were undertaken on legal advice, mainly with a view to greater clarity and conciseness. On a motion by Mr. Percy Good, seconded by Mr. A. Cunnington, it was agreed that these By-laws should be put before an Extraordinary Meeting for formal adoption at the earliest convenient date.

Lighting Problems and Reconstruction.

Following the completion of formal business Mr. R. O. Ackerley gave an address reviewing Lighting Problems involved in Post-War Reconstruction, of which a summary appears on the following page. In introducing his subject Mr. Ackerley explained that the address was to be regarded as a substitute for those usually delivered on such occasions by eminent illuminating engineers from abroad—a measure that was obviously impracticable in the present year. His address was based largely on the co-ordination and condensation of ideas collected from members of the Society and others specially interested in these particular problems. It was to be realised that if the address contained any intelligent suggestions they would be the contributors' and if there were any faults they would be his!

The address was, however, received with acclamation and, after leading members of the Society and architects and other guests present had warmly approved the suggestion that machinery should be set up for studying these problems forthwith, a resolution to this effect was carried unanimously and the Council were enjoined to "get on with it."

A vote of thanks to Mr. Ackerley, proposed by the President and seconded by Mr. E. J. Stewart, terminated the meeting.

Lighting and Reconstruction

In what follows we give a summary of the address delivered by Mr. R. O. Ackerley, following the Annual General Meeting of the Illuminating Engineering Society on May 13, 1941.

In recalling how this address came to be prepared, Mr. Ackerley said that the first intention was merely to present some ideas for the planning of lighting in a long term programme, but the subject was soon found to be so vast that an address on these lines would last for days, or even weeks! The great possibilities of useful preparatory work to be done by the Society were, however, evident. He, therefore, finally decided to confine himself to suggesting some of the subjects that might receive attention and the sort of organisation to study them—the ultimate object being what one might call an I.E.S. Reconstruction Charter.

Lighting is a vital service in any modern community, the use of which may make or mar a whole town or an individual building. The first question raised in connection with reconstruction is, "How can we plan the lighting of the future until we know what sort of a world we have got to plan?" Will all buildings have to be designed with a view to resistance to bombing, and with all lighting arrangements planned for easy black-out? In any case, will buildings be fundamentally different in design from those with which we are now familiar? Will the relaxation of lighting restrictions create a demand for even more artificial light or will it cause some sort of back to nature movement? Will there be a psychological reaction against co-operation? Will the community want to spend money on lighting and have money to spend?

To some questions we can suggest or even influence answers. Psychological questions can be answered by education in which the Society can play a part. As regards the economic question the answer is clear. In the long run, whatever be their experiences during the war, the citizens of our cities, rich in historical associations, are going to see them rise again, no less beautiful and no less worthy of their pride. Answers to many questions may well be "yes" in one district but "no" in another. Let us, however, get busy making preparations on a broad and flexible basis, ready for whatever may eventuate.

Lighting can in most cases be planned ahead, as the outcome of applied knowledge, not treated as an afterthought. It should be flexible, allowing for the adoption of new methods where expedient. If general principles are agreed there is only one way by which they can secure general adoption—by the closest co-operation between lighting engineers and the architectural profession. There are many factors which control and influence lighting possibilities—the provision of ample space for housing, lighting equipment, the co-ordination with ventilation, etc., the provision of architectural features to make the most of a building, such as recesses to conceal equipment, facilities for signs and floodlighting, etc.

Similar considerations apply to the planning of cities, parks, and gardens and the laying out of factory sites. Take, again, the lighting of the roads of New England. Many suggestions bear on control, co-ordination and standardisation. There is general agreement in regard to the need for greater uniformity of practice. But how far can guidance be given in regard to standardisation of heights and spacings? What can be learned from the experiences of the black-out? Can we make more use of luminous panels, and—in built-up cities—do away with lighting posts, devise indications for all turnings and crossings, and illuminate all street names and house numbers? Are we to expect two-floor streets with walkways and shop windows at first floor level, and how should we light such streets? There is also much to consider in amenity lighting, the floodlighting of historic buildings, the illumination of gardens in our parks and fountains in our public squares, and the place of illuminated signs in our new cities.

Turning next to interiors, Mr. Ackerley remarked that much had been said on windowless buildings. Into most of our huge stores, theatres, and restaurants daylight already rarely penetrates. Why then not eliminate windows, which would make the control of light, heat, and ventilation so much easier? "Built-in lighting" is another problem demanding the co-operation of the architect.

That the demand for more and more light will continue seems certain, but there are also certain features of lighting of chief moment in connection with certain types of buildings (schools, public libraries, churches, art galleries, and hospitals) which need to be defined and specified. Legislation will doubtless secure in factories very much better lighting than in the past, but we have new conceptions arising through war experience, such as the psychological effect of background brightness, which will need study in the future. There are also the fundamental requirements of office lighting and the elements of shop lighting, and the question of daylight design—for example, contriving a type of factory construction which will reconcile the requirements of day and night lighting to the advantage of both.

After dealing briefly with lighting conditions in the home, Mr. Ackerley reached the last stage of his address by asking, "What is the Illuminating Engineering Society going to do about all this?"

He suggested, as an immediate programme, the setting up of a series of committees or panels, to study these problems simultaneously from the political and the technical angles. Contact should be made with other technical bodies in relation to problems in which they are interested. Results may have to be achieved partly by persuasion and partly—as already initiated in connection with factory lighting—by the aid of legislation. But one of the first tasks might be the preparation of technical pamphlets on various aspects of lighting, setting out the main principles in terms which everyone could follow.

In conclusion Mr. Ackerley disposed of the suggestion that people are too busy now to plan for the future, and that such ideas must wait until peace came nearer. That might well be a fatal policy. On at least two occasions the Prime Minister had told us that the end might well come sooner than we had now any right to hope. We should, therefore, do well to be ready with suggestions, for peace, when it did come, might come very suddenly.

Exhibition of Factory Lighting

Opened at the E.L.M.A. Lighting Service Bureau (2, Savoy Hill, London, W.C.2), by Sir Duncan Wilson, C.V.O., C.B.E., on May 27.

This new exhibition, which is expressly designed to illustrate the application of the Factories (Standards of Lighting) Regulations, 1941, was opened by Sir Duncan Wilson, Chairman of the Departmental Committee on Lighting in Factories, on May 27. Mr. J. Y. Fletcher, Chairman of the E.L.M.A. Council, presided, and an address briefly reviewing some of the chief exhibits was given by Mr. W. J. Jones.

Sir Duncan Wilson, in his introductory remarks, pointed out that the eye is the most important and most used organ in productive work. It is singular, therefore, that statutory requirements of good lighting, only introduced in July, 1938, were so long in coming. With the advent of war and the attendant black-out conditions, the need for greatly improved lighting was intensified. Inadequate lighting conditions lead to fatigue, discomfort, and a lowered output of poorer quality, which in wartime it is vital to avoid. Hence the new standards which came into operation on February 1 of this year. In conclusion Sir Duncan emphasised the value, to factory managers and welfare officers, of this exhibition, which was complementary to the work of the National Industrial Electric Lighting Service, of which he had the honour to be chairman.

The exhibition is supplemented by an explanatory handbook in which the bearing of the various demonstrations on the Regulations is explained. The lecture theatre is adapted to the demonstration of widely different conditions of illumination. Visitors were shown in turn the effect of the general illumination of 6 foot-candles, the minimum prescribed in the Regulations, and ascending values of illumination as covered by the I.E.S. "code." These illuminations were furnished by different methods, utilising tungsten filament, mercury, sodium, fluorescent mercury and the new 5-ft. fluorescent lamps, and the effect of direct diffused and indirect lighting in relation to such problems as glare and specular reflection could be studied. Of special interest is the comparative psychological effect of the higher illuminations produced by conventional arrangements of filament units and the 5-ft. lamps giving a daylight effect. The combined diffusion, softness and resemblance to daylight of illumination produced by a number of these lamps is very agreeable.

A great deal has been said recently in regard to the importance of "quality" of lighting as compared with intensity. This was well illustrated by experiments showing the depressing, so-called "tunnel effect" experienced when the upper part of a workroom is dark in colour and standard opaque dispersive reflectors are used. The importance of allowing a certain amount of light to fall upon the ceiling and upper parts of the room, illustrated by tilted angle reflectors mounted on a sideway wall, and the immense value of light surroundings in alleviating black-out conditions and improving the general "atmosphere" were shown in the adjacent demonstration rooms. Here, one section has been converted into a model of a blacked-out north light factory bay. There are models of typical industrial lighting units, some specially designed to meet present needs, and the effects of the daylight lamps, when applied to form a species of artificial window, can be studied.

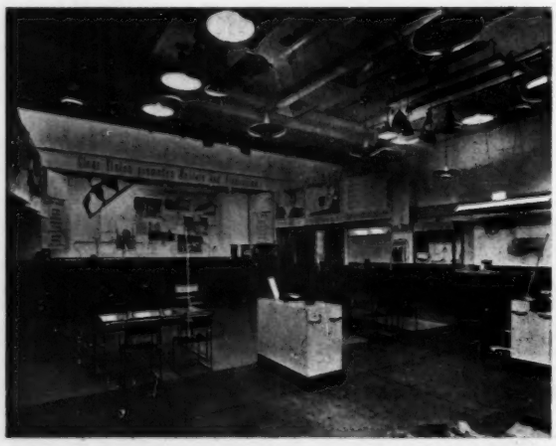


Fig. 1. A section of the Lecture Theatre showing alternative methods of industrial lighting, which were demonstrated in turn to the audience.

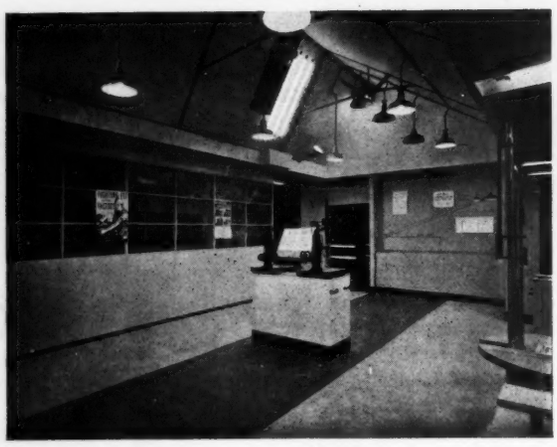
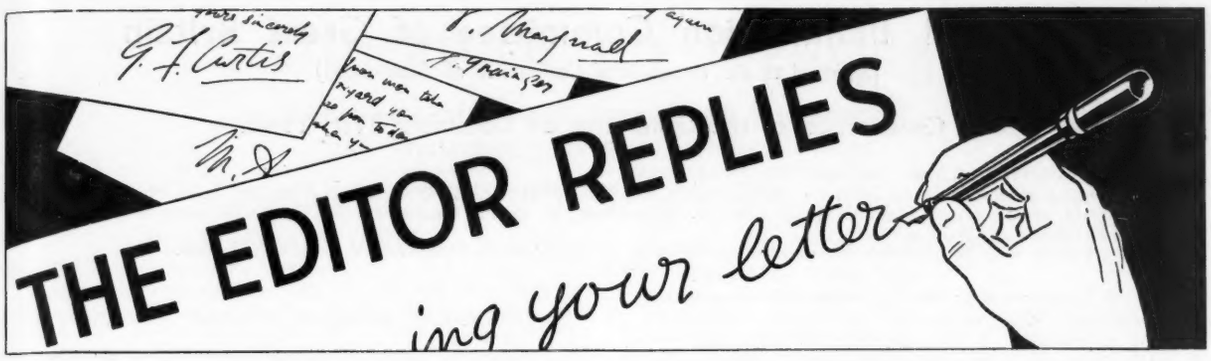


Fig. 2. Another section of the Exhibition where the effect of various fittings can be studied and the use of fluorescent tubular lamps demonstrated.

Other demonstrations were designed to show the minimum mounting heights of direct lighting reflectors in relation to light-output, the principles involved in the design of British standard dispersive reflectors with a 20 deg. cut-off, the values of brightness met with from various light sources, in practice, and the importance of regular maintenance of lighting equipment. There was also a "chamber of horrors" in which typical examples of bad lighting practice may be seen.

Apart from these special industrial lighting demonstrations there are many other items well worth examination. There are, for example, the booths in which the effect of light on speed of vision, the influence of the colour of walls and the size of room on the resultant illumination, the formation of shadows, etc., are demonstrated, and there is a section where A.R.P. lighting equipment, including fittings to furnish low illuminations, street and shelter signs, masks for motor car headlights, etc., are on view.

Visitors were also intrigued by a little device which we believe has been in operation for some time, the rows of telephones, with indications attached, to the effect that talks on industrial lighting, light in the home, etc., are on tap for those interested. As soon as the receiver is lifted and applied to the ear the talk begins and continues until the gramophone—one of a series in an adjacent cupboard interconnected with the telephones—has run its course.



The perennial question of **Jobs.** The emergency through which we are passing is at least having one result—that the difficulty in finding some sort of occupation is becoming much less than in normal times. At one time the number of applications received invariably exceeded the vacancies. Now advertisements of situations are more numerous (see, for example, notices on p. 86), and younger I.E.S. members should readily find work, if free to undertake it.

The difficulty, of course, in the case of men approaching military age is that they are apt to be claimed for the Forces so soon that it is hardly worth while to commence training them. In one case that came under our notice an employer has hit upon the idea of inviting applications from bright boys of fifteen years of age. He has found that the pick of such applicants can be trained to do work usually allotted to employees five years older—and he has the satisfaction of knowing that he will be able to retain their services, unless this war lasts longer than is commonly imagined.

I have been questioned about the **"night/day" accident ratio,** frequently mentioned in analyses of street fatalities, and again figuring in a note in this issue (p. 82). The big variations in this ratio in different records are apt to prove confusing to the uninitiated. The ratio, naturally, varies with the time of year, the proportion of night accidents being greatest for the dark winter months. Recent data show clearly the effect of the black-out, but, of course, many factors besides lighting are involved, and interpretations should be made with care. For example, the figure for traffic fatalities in the U.S.A., 35,000 for the whole of 1940, or an average of about 3,000 per month, seems high as compared with Great Britain, where the highest value ever attained for a single month (in December, 1940) was 1,313. But there are no doubt explanatory factors, such as the higher population, the greater use of motor vehicles, and the far greater mileage of unlighted rural roads.

I am still often asked: **"Do we really need the much higher illuminations** now being provided?" Old stagers contrast present conditions with those in the workshops a generation ago, when people worked by light almost equivalent to that of a candle flame, and worked hard and for long hours, too. Except for such exceptional researches as those of the D.S.I.R., it is most difficult to put one's hand on **proof,** of a character scientifically acceptable, of the benefits of good illumination. My own belief is that in the old days the degree of accuracy demanded was, on the whole, less and the speed of operation very much slower. Something must also be allowed to remembrances of youth. If one is young and has good sight one seems to be able to *manage* with less light (this does not mean that one would not benefit by more). But as one gets older one discovers, for example, that small type readable at high illuminations becomes barely distinguishable with moderate values. When all is said and done the truth remains that, once the higher illuminations have been introduced, nobody, either management or staff, ever desires to retrace his steps in this respect.

It is, of course, a condition that the higher illumination must not be vitiated by glare. When super-illuminations were being introduced in the U.S.A. one writer asked: **"What is wrong with our 50 foot-candle installations?"** and drew the conclusion that with conventional types of units, even enclosed diffusing fittings of good design, the glare overhead became too great. Hence the movement towards indirect lighting and louvred fittings in the U.S.A.

Visitors to the recently opened Exhibition of Industrial Lighting, at the E.L.M.A. Lighting Service Bureau, can satisfy themselves in regard to the good qualities in this respect of the new fluorescent "daylight" tubes. The low brightness of the source enables quite high illuminations to be reached without one becoming aware of the blaze overhead. It struck me, however, that a little art is necessary in **demonstrating this system.** When the daylight lamps are switched on the very absence of this expected "blaze" produces a momentary sensation of flatness. It is only after it has been in operation for some little time that one becomes fully aware of its enduring good qualities.

I do not think, however, that any system—even such a good one as this—relieves one from the necessity of planning for maximum effect. I have always considered, for example, that when work is done on **very dark materials** something in the nature of local lighting, or, alternatively, exceptionally subdued surroundings, is expedient in order to maintain the illuminated work as the centre of interest.

National Illumination Committee of Great Britain

(Affiliated to the International Commission on Illumination)

Constitution of the Committee on December 31st, 1940.

NOMINATED BY THE CONTRIBUTING ASSOCIATIONS:—

Illuminating Engineering Society: A. W. BEUTTELL, DR. H. BUCKLEY, J. S. DOW, DR. S. ENGLISH, L. H. MCDERMOTT.
Institution of Electrical Engineers: LT.-COL. K. EDGCUMBE, P. GOOD, PROFESSOR J. T. MACGREGOR-MORRIS, DR. C. C. PATERSON, J. W. TOWNLEY.
Institution of Gas Engineers: W. J. A. BUTTERFIELD, J. E. DAVIS, G. DIXON, E. V. EVANS, S. LACEY.

NOMINATED BY THE CO-OPERATING ASSOCIATIONS:—

Admiralty: W. C. M. COUCH.
Air Ministry: C. B. COLLINS, W. J. F. WELLARD.
Association of Public Lighting Engineers: E. J. STEWART.
British Commercial Gas Association: D. CHANDLER.
British Electrical and Allied Manufacturers' Association: G. CAMPBELL, T. E. RITCHIE.
British Electrical Development Association: A. C. CRAMB.
Department of Scientific and Industrial Research: (*National Physical Laboratory*) DR. J. W. T. WALSH, T. SMITH.
Electric Lamp Manufacturers' Association: W. J. JONES, C. W. SULLY.
Glass Manufacturers' Federation: E. J. C. BOWMAKER, G. MARCHAND.
Home Office: E. W. MURRAY.
Incorporated Municipal Electrical Association: E. J. JARVIS.
Industrial Health Research Board: H. C. WESTON.
Institution of Municipal and County Engineers: E. J. ELFORD.
Medical Research Council: DR. H. HARTRIDGE.
Ministry of Health: A. SCOTT.
Ministry of Transport: E. S. PERRIN.
Ministry of Works and Buildings: G. SMITH.
National Gas Council: F. C. SMITH.
Post Office: SIR HENRY BASHFORD, H. W. FULCHER.
Railway Clearing House: M. G. BENNETT, A. CUNNINGTON.
Society of British Gas Industries: F. J. GOULD, A. R. MCGIBBON, R. J. ROGERS.
Society of Glass Technology: DR. B. P. DUDDING.
War Office: BREVET COL. C. M. SIMPSON.

OFFICERS:

Chairman: LT.-COL. K. EDGCUMBE.
Vice-Chairmen: DR. C. C. PATERSON and W. J. A. BUTTERFIELD.
Hon Treasurer: W. J. A. BUTTERFIELD, 66, Victoria Street, London, S.W.1.
Hon. Secretary: L. H. MCDERMOTT, The National Physical Laboratory, Teddington, Middlesex.

The Committee has made the following appointments:—

Representatives of Great Britain on the Executive Committee of the International Commission on Illumination:—

LT.-COL. K. EDGCUMBE and DR. H. BUCKLEY.

ANNUAL REPORT FOR THE YEAR 1940

(Presented at the Annual Meeting of the Committee held on Thursday, March 6th, 1941)

Owing to the war situation, it has not been possible for the National Committee to carry on any active work during the past year.

As reported in the Annual Report for 1937, the year 1940 should have seen the introduction of the new candle which is such that the brightness of the black body at the freezing point of platinum is sixty candles per square centimetre. The International Committee of Weights and Measures should have met in October, 1939, and presumably would have authorised the use of the new candle. As, however, the meeting could not be held, it has been agreed that no action in this respect shall be taken for the present. Thus the existing unit will continue to be used until conditions make it possible to effect the change.

At the meeting of the International Commission on Illumination in Holland in 1939, the subject "Calculation of Beam Intensity of Projector Systems" was introduced into the programme of the Commission, with Great Britain as the secretariat country. Copies of a draft specification prepared by the British sub-committee dealing with this subject were sent to all national committees early in the year. Comments have been received from the United States and China, and a report will be issued in the near future.

The sub-committee on Mine Lighting was reconstituted early in the year consequent on the death of Professor R. V. Wheeler, who had acted as its chairman since it was formed in 1933. His place has been taken by Professor Ivon Graham. A programme of work was under consideration, but war developments prevented any further progress being made.

It is interesting to note that the German National Committee attempted to fulfil the obligation it assumed at the meeting of the International Commission on Illumination in 1939, when it promised to prepare sets of coloured filters for circulation and measurement in various national laboratories. These sets were sent to Holland in the spring, and a request was made by the Dutch Committee as to whether the British Committee was in a position to receive them. War developments prevented the matter being taken further, otherwise very desirable progress might have been possible in a matter of considerable scientific interest.

At the annual special meeting of the National Committee, held on March 5 last, the chairman (Col. K. Edgcumbe), the vice-chairmen (Mr. W. J. A. Butterfield, and Dr. C. C. Paterson), and the honorary treasurer (Mr. W. J. A. Butterfield) were all re-elected.

Mr. L. H. McDermott, assistant honorary secretary, was elected honorary secretary in place of Dr. H. Buckley. The resignation of Dr. H. Buckley from the honorary secretaryship, which he has held since 1923, was received with very great regret, and he was most heartily thanked for his past services to the committee. Colonel K. Edgcumbe and Dr. H. Buckley were elected representatives of Great Britain on the Executive Committee of the International Commission on Illumination.

The following changes in membership of the Committee occurred during the past year:—

Dr. C. C. Paterson has been appointed a representative of the Institution of Electrical Engineers in place of the late Mr. H. W. Gregory. Mr. L. H. McDermott has been appointed a representative of the Illuminating Engineering Society to fill the vacancy created by the retirement of Dr. C. C. Paterson. Mr. T. Smith has been appointed a representative of the National Physical Laboratory in place of the late Sir Joseph Petavel.

The membership of the National Illumination Committee is identical with that of the Illumination Industry Committee of the British Standards Institution. As such, they have been responsible for a considerable amount of work which has been carried out in connection with A.R.P. lighting and for the issue of many A.R.P. specifications during the year.

K. EDGCUMBE, Chairman.

Literature on Lighting

(Abstracts of Recent Articles on Illumination and Photometry in the Technical Press)

(Continued from page 78, May, 1941)

III.—SOURCES OF LIGHT.

108. 100-watt Fluorescent Lamps.

Anon. Magazine of Light, X., No. 1, p. 13, Feb., 1941.

Illumination values of 40 ft.c. is the objective from installations of 100 w. fluorescent lamps both in an existing engineering works and in one in construction in America. C. A. M.

109. Pulsating Character of A.C. Lighting.

T. A. Ledward. The Electrical Times, Vol. 99, No. 2,587, May 22, 1941.

Tests have been made using a photo-cell and cathode ray oscillograph of the amount of ripple present in the light from different sources. It was found that the ripple amplitude was least for carbon lamps and less for high wattage lamps than for low wattage. Decrease in the frequency of supply decreases the ripple frequency and increases the ripple amplitude. The effect is most noticeable for mercury vapour lamps. W. E. H.

IV.—LIGHTING EQUIPMENT.

110. Portable Lighting Unit.

Anon. Elect., 126, p. 276, May 9, 1941.

A description is given of a small A.R.P. rescue unit consisting of a dispersive reflector housing five battery supplied 12 w. bus lamps. C. A. M.

111. Portable Fluorescent Unit.

Anon. Elect., 126, p. 275, May 9, 1941.

A description is given of a portable 5 ft. 80 w. fluorescent tube fitting arranged to burn either horizontally or vertically. C. A. M.

112. Depreciation.

Aileen Page. Magazine of Light, X., No. 1, p. 40, Feb., 1941.

Data are given on depreciation results obtained on study lamps and similar fittings. C. A. M.

113. The Heating of Factory and Office Lighting Fittings and their Connecting Leads.

H. G. Taylor, W. Lethersich, P. D. Morgan. Beama Journal, 48, pp. 67-68, April, 1941.

The concluding instalment is given of the results of research carried out by the B.E.A.I.R.A. on the heating of factory and office lighting units and their connecting leads. C. A. M.

114. A High Efficiency "Piped Light" Illuminator.

C. A. Morrison. Review of Scientific Instruments, Vol. 12, No. 3, March, 1941.

This illuminator enables light to be supplied to a confined area inaccessible to ordinary illuminators. A concentrated filament source is placed at one focus of an elliptical mirror. A spherical concave mirror perforated at the vertex, whose radius of curvature coincides with the first focus of the elliptic mirror, is placed in contact with it. By this means most of the flux of the lamp eventually passes through the second focus of the elliptic mirror, at which there is a polished glass rod which passes through the vertex of the spherical mirror to the necessary point. The light rays are conducted to the far end of the rod by internal reflection. W. E. H.

115. Durability of Optical Glass.

Frank L. Jones. Journal of the American Ceramic Society, Vol. 24, No. 4, April, 1941.

The effect of weathering on optical glasses and the optical systems of instruments has been studied. It has been found that glass which remained in a humid atmosphere became covered with a film of soluble alkaline salts. In another form of weathering transparent silica-rich films are formed. Although the surface appears coloured due to interference effects, a filmed glass is usually not harmed. W. E. H.

116. Phosphate Glasses and Some Characteristic Properties.

N. J. Kreidl and W. J. Weyl. The Glass Industry, Vol. 22, No. 5, May, 1941.

Nearly all commercial glasses contain silica. A study has now been made of a series of pure phosphate glasses, which proved to have, among other interesting properties, high ultra-violet transmission. This has been attributed to the close similarity between the structures of crystalline aluminium phosphate and quartz. W. E. H.

V.—APPLICATIONS OF LIGHT.

117. Illumination Design Data.

Anon. Magazine of Light, X., No. 1, p. 19, Feb., 1941.

Illumination design data for various types of luminescent tubular lamp fittings are given, with due regard to variations of size of rooms and finish of wall surfaces. Results are in terms of the number of square feet per 40 w. lamp to give 50 ft.c. in service. C. A. M.

118. Office Lighting.

D. W. Prideaux, J. C. Forbes. Magazine of Light, X., No. 1, pp. 22-28, Feb., 1941.

Instances of modern office lighting equipment in America are described with photographs. Fluorescent tubular lamps in continuous lengths built into the ceiling are used extensively. A strong recommendation is made for the use of lighter coloured desk tops in order to reduce contrasts in brightness. The reflection factor of desk tops, it is suggested, should be in the region of 25 to 30 per cent. C. A. M.

119. Lighting Problems After the War.

Anon. The Electrical Times, Vol. 99, No. 2,587, May 22, 1941.

Details are given of the suggestions made to the Minister of Reconstruction by the Joint Lighting Committee of the Architectural profession and E.L.M.A. Tabulated data of the minimum schedule of wiring points for domestic installations are included. W. E. H.

120. Exhibition of War-time Lighting.

Anon. The Electrical Times, Vol. 99, No. 2,588, May 29, 1941.

Describes the exhibition of war-time industrial lighting organised at the E.L.M.A. Lighting Service Bureau. Different systems of lighting for blacked-out factories are discussed and their merits assessed. W. E. H.

121. Light Car Interiors to Twenty Foot-Candles.

Anon. El. World, 115, p. 1,172, April 5, 1941.

Fluorescent tubular lamps are used for providing good lighting on the assembly line where interior equipment is fitted to motor car bodies. Details of the installation are given, and an illumination of 20 ft.c. is claimed S. S. B.

122. Museum Lighting.

F. C. Herpich. Magazine of Light, X., pp. 17, 33, Feb., 1941.

The use of fluorescent tubes for show-case lighting in a museum at Yale is illustrated and described. C. A. M.

123. Store Lighting.

K. C. Welch, R. A. Siedle, J. H. W. Conklin. Magazine of Light, X., No. 1, pp. 8, 9, 11, 14, 15, 16, Feb., 1941.

Descriptions with photographs are given of modern lighting installations in stores in America. Built-in fluorescent lamps are used extensively. C. A. M.

124. Dramatic Lighting for Jewellery Store.

H. H. Carpenter. El. World, 115, p. 838, March 8, 1941.

Some details are given of the lighting provided in a small American jewellery store. The results are claimed to be very effective. S. S. B.

125. Lighting in South Africa.

Anon. The Electrical Times, Vol. 99, No. 2,586, May 15, 1941.

An account is given of recent examples of indoor lighting and also of the complete outdoor lighting scheme of the Civic Centre at Pretoria. The latter is noteworthy in that a combination of 400 watt H.P.M.V. lamps and fluorescent tubing is used. W. E. H.

126. Fluorescent Lamps and Colour Determination.

Anon. The Electrical Times, Vol. 99, No. 2,587, May 22, 1941.

Brief details are given of a fluorescent installation in a Government factory where constancy of illumination and colour are of great importance in determining colour changes in a liquid. An illumination of 120-150 ft.c. is obtained over an area of 6 ft. by 4 ft. 6 in. W. E. H.

127. Fluorescent Lamps.

Anon. Elect., 126, p. 275, May 9, 1941.

A brief description is given of an installation of fluorescent lamps used to detect small colour changes in an acid reaction. It was found that 120-150 ft.c. were necessary to detect these changes and that the fitting used, with a chromium-plated brass reflector, required 4 80-watt fluorescent lamps. C. A. M.

128. Germicidal Lamps.

Anon. Magazine of Light, X., No. 1, pp. 10-11,13, Feb., 1941.

A description, with photographs, is given of germicidal lamp equipment used in an American hotel. C. A. M.

129. Infra-Red Application Studies Develop New Guides.

Anon. El. World, 115, p. 1,147 April 5, 1941.

A summary is given of a report on a very full review of American applications of radiant heat from lamps to moisture-drying and baking of industrial finishes, with an investigation of energy densities of radiaton used. A considerable amount of data is presented, with a view to providing a scientific basis for recommendations for future use. S. S. B.

130. Reflection Characteristics with Polarised Light.

Jacques Laurence. J. Op. Soc. Amer., Vol. 31, No. 1, pp. 9-13, January, 1941.

Gives reflection characteristics of paper and printing into illuminated with natural and polarised light and discusses the value of polarised light in reducing eyestrain. A. E. S.

The Illuminating Engineering Society (U.S.A.)

Notes on Transactions (March, 1941)

NEWS: "*Recommended Practice of Street Lighting*" has been reprinted in bulletin form. Another new I.E.S. Chapter (in Connecticut) has been formed. The Westinghouse Co. is erecting the largest plant in the world for the manufacture of fluorescent lamps. The building will be windowless and adapted to black-out emergencies.

CONTRIBUTIONS: *The Bases of Color Vision, by L. H. Hardy; Colour Systems and Their Inter-Relation, by D. L. Judd; The Illuminant in Colour Matching and Discrimination, by Dorothy Nickerson.* These papers form part of a group presented at the thirty-fourth annual convention in September last. The latter paper is specially interesting as a record of practical tests on samples of cotton, etc. *Relation Between Electric and Spectroscopic Characteristics in Low Pressure Discharges, by C. G. Found and E. F. Hennelly.* The possibility of establishing quantitative expressions for intensity of radiation and the nature of the controlling factors responsible are discussed and comparisons of calculated and observed values of resonance radiation are presented, with the aid of diagrams. *The Design of Classrooms for High Level Daylight Illumination, by L. H. Brown.* Various methods of providing daylight in schoolrooms are reviewed. The best arrangement is based on high flat ceilinged rooms with bilateral lighting. The design of windows and the nature of interior decoration are discussed in detail. Using materials of suitable reflecting power, twenty-five foot-candles of natural illumination should almost always be available during school hours and brightness contrasts should not exceed 100 : 1.

Obituary

MR. JUSTUS ECK

We record with great regret the death of Mr. Justus Eck, which occurred on May 21 at the age of seventy-five. Mr. Eck had a varied and distinguished career as an electrical engineer, being concerned for many years in lighting, power and traction work, prior to his becoming manager of the Union Electric Company in 1901. His interest in arc lamps (he was the author of a text-book on the subject) led him to become intimately associated with illumination. He was one of the founder members of the Illuminating Engineering Society, served on the Council, and was created an honorary life member in recognition of his long period of useful service to the Society. Mr. Eck was also one of the founders of the Electrical Industries Benevolent Association, of which he became honorary secretary. It was characteristic of his kindly disposition that he should devote himself so assiduously to this charitable object. He made many firm friends in the electrical industry, where his loss will be the subject of general regret.

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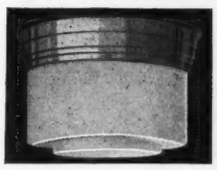

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INDEX TO "WHERE TO BUY"

N.B.—The numbers are those attached to individual entries in the Directory
(See pp. 91–92)

Photometric Terms

Manufacturers in these days frequently have to go far beyond their primary business of producing and selling—they must, for example, share in the education of their clients. We are reminded of this by a simple leaflet now being issued by Messrs. Everett, Edgcumbe and Co., Ltd., who as instrument makers also specialise in photometric instruments. The leaflet, which occupies two pages, defines the chief photometric terms and units (candlepower, flux and illumination), and also deals with such supplementary conceptions as brightness, coefficients of utilisation, "efficiency" and "light output ratio." The explanations are aided by diagrams illustrating the nature of the polar curve, measurements on the photometric bench, and the calculation of illumination. The leaflet is brought up to date by further explanations of the "daylight factor" and of the newly-introduced unit, the "equivalent foot-candle" made necessary by the special problems (such as those associated with the Purkinje effect) involved in measurements at very low illuminations.